APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/616,385	07/14/2000	Enric Musoll	P3809	5804

24739   7590   06/05/2003

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EXAMINER
COLEMAN, ERIC

ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 06/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____ .

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)   4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5) ☐ Notice of Informal Patent Application (PTO-152)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .   6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Eickenmeyer (patent No. 6,061,710)(submitted by applicant) in view of Borkenhagen

(patent No. 6,076,157) (submitted by applicant) and Kalafatis (patent No. 6,535,905).

3.   Eickemeyer taught the invention substantially as claimed including a data

processing ("DP") system comprising:

        a) Multi-streaming processor (e.g., see col. 5, lines 29-55);

        b) Means and method for selecting which stream to fetch instructions (e.g., see

col. 6, line 51-col. 8, line 14); and

4.   Branch predictor for forecasting whether a branch alternative of branch

instructions will be taken (e.g., see col. 8, lines 43-65).

5.   Eickemeyer did not expressly detail (claims 1,6,11,16) a fetch algorithm.

However, since the Eickmeyer system predicted whether a branch path was taken or

not taken using indicators such as availability of hardware context (e.g., see col. 11, line

53-col. 12, line 64) then it would have been obvious to one of ordinary skill in the art that

the Eickemeyer system used determination of whether a branch path for was to be

taken or not taken in at least one fetch algorithm for determining which thread was to be fetched. On the other hand, Borkenhagen taught the use of a fetch algorithm that included switching threads (e.g., see col. 16, lines 11-38 and col. 12, lines 1-38). Eikemeyer and Borkenhagen however did not expressly (claims 1,6,11,16) detail that the predictor for switching threads or streams included whether a branch was taken. Kalafatis however specifically taught a switch on branch logic (152)(e.g., see col. 10, lines 8-59) that used a scheme or algorithm that determined whether to switch threads depending on whether a branch was predicted as taken.

6.   It would have been obvious to one of ordinary skill in the DP art to combine the teachings of Eickemeyer and Borkenhagen. Both references were directed toward solving the problems of efficient switching between instruction streams or threads. One or ordinary skill would have been motivated to incorporate the details of how to algorithmically determine which stream to select as taught by Borgenhagen into the Eickemeyer system because that would have provided more accurate selection of the proper instruction stream.

7.   Furthermore it would have been obvious to one of ordinary skill to combine the teachings of Kalafatis with teachings of Eikemeyer as they were both directed to the problems of efficient switching between instruction streams or threads. One of ordinary skill would have been motivated to incorporate the Kalafatis teaching of a switch on branch logic for switching threads when a branch was predicted taken in order to reduce the allocation of processor resource to that specific thread in view of the possibility of that specific thread being mispredicted (e.g., see col. 10, lines 8-24 of Kalafatis).

8.   As per claims 2,3,12,13, Borkenhagen and Eickemeyer did not specify this

limitation. Kalafatis however taught the limitation of switching to the target location for

fetching instructions when a branch was predicted as taken and to continue sequential

fetching when a branch was not taken. As to the condition of a cache miss (claims

7,8,17,18) Eickemeyer taught the switching of instruction streams on a cache miss

(e.g., see col., 9, lines 7-25) and continuing on the same stream on a cache hit (e.g.,

see col. 8, line 43-col. 9, line 6).

9.   As per claims 4,5,9,10,14,15,19,20,21-24 Eickenmeyer did not specify this

limitation. Borkenhagen taught the use of predictors to determine if a branch was to be

taken or not (e.g., see col. 16, lines 11-38) and dispatching the instructions to execution

units (e.g., see col. 8, lines 15-39) and selective switching on a cache miss (e.g., see

col. 10, line 58-col. 11, line 17). Eickemeyer also taught selecting criteria for determining

a thread switch (e.g., see col. 9, lines 7-57).

10.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Eric Coleman whose telephone number is (703) 305-

9674. The examiner can normally be reached on Monday-Thursday.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Eddie Chan can be reached on (703) 305-9712. The fax phone numbers for

the organization where this application or proceeding is assigned are (703) 746-7239 for

regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (703)-

305-3900.

EC

June 1, 2003

ERIC COLEMAN
PRIMARY EXAMINER